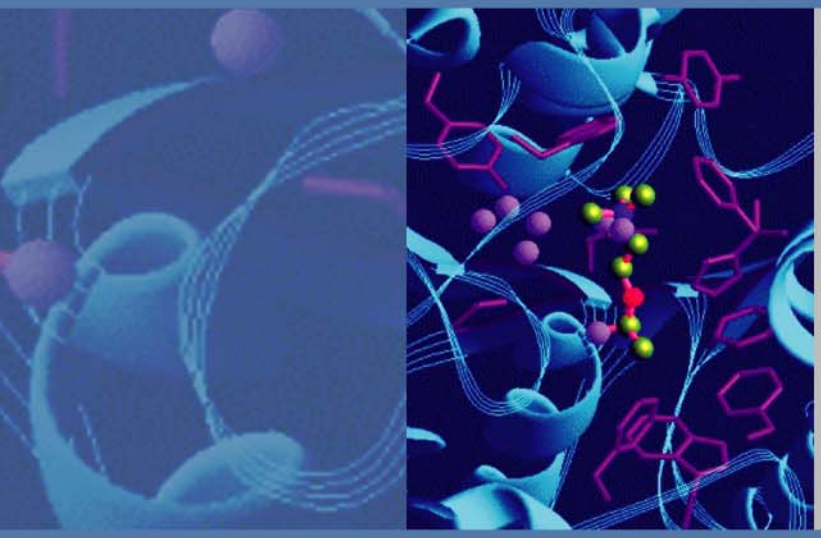

Thermo Scientific A/D Converter

User Guide

XCALI-97295 Revision A March 2011

DOCUMENTATION SURVEY

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Thermo SCIENTIFIC

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	Electric Shock: This instrument uses high voltages that can cause personal injury. Before servicing, shut down the instrument and disconnect the instrument from line power. Keep the top cover on while operating the instrument. Do not remove protective covers from PCBs.	**Elektroschock:** In diesem Gerät werden Hochspannungen verwendet, die Verletzungen verursachen können. Vor Wartungsarbeiten muß das Gerät abgeschaltet und vom Netz getrennt werden. Betreiben Sie Wartungsarbeiten nicht mit abgenommenem Deckel. Nehmen Sie die Schutzabdeckung von Leiterplatten nicht ab.	**Choc électrique:** L'instrument utilise des tensions capables d'infliger des blessures corporelles. L'instrument doit être arrêté et débranché de la source de courant avant tout intervention. Ne pas utiliser l'instrument sans son couvercle. Ne pas enlever les étuis protecteurs des cartes de circuits imprimés.	**Descarga eléctrica:** Este instrumento utiliza altas tensiones, capaces de producir lesiones personales. Antes de dar servicio de mantenimiento al instrumento, éste debera apagarse y desconectarse de la línea de alimentacion eléctrica. No opere el instrumento sin sus cubiertas exteriores quitadas. No remueva las cubiertas protectoras de las tarjetas de circuito impreso.	**Shock da folgorazione.** L'apparecchio è alimentato da corrente ad alta tensione che puo provocare lesioni fisiche. Prima di effettuare qualsiasi intervento di manutenzione occorre spegnere ed isolare l'apparecchio dalla linea elettrica. Non attivare lo strumento senza lo schermo superiore. Non togliere i coperchi a protezione dalle schede di circuito stampato (PCB).
	Chemical: This instrument might contain hazardous chemicals. Wear gloves when handling toxic, carcinogenic, mutagenic, or corrosive or irritant chemicals. Use approved containers and proper procedures to dispose waste oil.	**Chemikalien:** Dieses Gerät kann gefährliche Chemikalien enthalten. Tragen Sie Schutzhandschuhe beim Umgang mit toxischen, karzinogenen, mutagenen oder ätzenden/reizenden Chemikalien. Entsorgen Sie verbrauchtes Öl entsprechend den Vorschriften in den vorgeschriebenen Behältern.	**Chimique:** Des produits chimiques dangereux peuvent se trouver dans l'instrument. Portez des gants pour manipuler tous produits chimiques toxiques, cancérigènes, mutagènes, ou corrosifs/irritants. Utiliser des récipients et des procédures homologuées pour se débarrasser des déchets d'huile.	**Química:** El instrumento puede contener productos quimicos peligrosos. Utilice guantes al manejar productos quimicos tóxicos, carcinogenos, mutagenos o corrosivos/irritantes. Utilice recipientes y procedimientos aprobados para deshacerse del aceite usado.	**Prodotti chimici.** Possibile presenza di sostanze chimiche pericolose nell'apparecchio. Indossare dei guanti per maneggiare prodotti chimici tossici, cancerogeni, mutageni, o corrosivi/irritanti. Utilizzare contenitori aprovo e seguire la procedura indicata per lo smaltimento dei residui di olio.
	Heat: Before servicing the instrument, allow any heated components to cool.	**Hitze:** Warten Sie erhitzte Komponenten erst nachdem diese sich abgekühlt haben.	**Haute Temperature:** Permettre aux composants chauffés de refroidir avant tout intervention.	**Altas temperaturas:** Permita que lop componentes se enfríen, ante de efectuar servicio de mantenimiento.	**Calore.** Attendere che i componenti riscaldati si raffreddino prima di effetturare l'intervento di manutenzione.
	Fire: Use care when operating the system in the presence of flammable gases.	**Feuer:** Beachten Sie die einschlägigen VorsichtsmaBnahmen, wenn Sie das System in Gegenwart von entzündbaren Gasen betreiben.	**Incendie:** Agir avec précaution lors de l'utilisation du système en présence de gaz inflammables.	**Fuego:** Tenga cuidado al operar el sistema en presencia de gases inflamables.	**Incendio.** Adottare le dovute precauzioni quando si usa il sistema in presenza di gas infiammabili.
	Eye Hazard: Eye damage could occur from splattered chemicals or flying particles. Wear safety glasses when handling chemicals or servicing the instrument.	**Verletzungsgefahr der Augen:** Verspritzte Chemikalien oder kleine Partikel können Augenverletzungen verursachen. Tragen Sie beim Umgang mit Chemikalien oder bei der Wartung des Gerätes eine Schutzbrille.	**Danger pour les yeux:** Des projections chimiques, liquides, ou solides peuvent être dangereuses pour les yeux. Porter des lunettes de protection lors de toute manipulation de produit chimique ou pour toute intervention sur l'instrument.	**Peligro par los ojos:** Las salicaduras de productos químicos o particulas que salten bruscamente pueden causar lesiones en los ojos. Utilice anteojos protectores al mnipular productos químicos o al darle servicio de mantenimiento al instrumento.	**Pericolo per la vista.** Gli schizzi di prodotti chimici o delle particelle presenti nell'aria potrebbero causare danni alla vista. Indossare occhiali protettivi quando si maneggiano prodotti chimici o si effettuano interventi di manutenzione sull'apparecchio.
	General Hazard: A hazard is present that is not included in the above categories. Also, this symbol appears on the instrument to refer the user to instructions in this manual.	**Allgemeine Gefahr:** Es besteht eine weitere Gefahr, die nicht in den vorstehenden Kategorien beschrieben ist. Dieses Symbol wird im Handbuch auBerdem dazu verwendet, um den Benutzer auf Anweisungen hinzuweisen.	**Danger général:** Indique la présence d'un risque n'appartenant pas aux catégories citées plus haut. Ce symbole figure également sur l'instrument pour renvoyer l'utilisateur aux instructions du présent manuel.	**Peligro general:** Significa que existe un peligro no incluido en las categorias anteriores. Este simbolo también se utiliza en el instrumento par referir al usuario a las instrucciones contenidas en este manual.	**Pericolo generico.** Pericolo non compreso tra le precedenti categorie. Questo simbolo è utilizzato inoltre sull'apparecchio per segnalare all'utente di consultare le istruzioni descritte nel presente manuale.
	When the safety of a procedure is questionable, contact your local Technical Support organization for Thermo Fisher Scientific San Jose Products.	Wenn Sie sich über die Sicherheit eines Verfahrens im unklaren sind, setzen Sie sich, bevor Sie fortfahren, mit Ihrer lokalen technischen Unterstützungsorganisation für Thermo Fisher Scientific San Jose Produkte in Verbindung.	Si la sûreté d'une procédure est incertaine, avant de continuer, contacter le plus proche Service Clientèle pour les produits de Thermo Fisher Scientific San Jose.	Cuando la certidumbre acerca de un procedimiento sea dudosa, antes de proseguir, pongase en contacto con la Oficina de Asistencia Tecnica local para los productos de Thermo Fisher Scientific San Jose.	Quando e in dubbio la misura di sicurezza per una procedura, prima di continuare, si prega di mettersi in contatto con il Servizio di Assistenza Tecnica locale per i prodotti di Thermo Fisher Scientific San Jose.

CAUTION Symbol	CAUTION	危険警告	危險警告
	Electric Shock: This instrument uses high voltages that can cause personal injury. Before servicing, shut down the instrument and disconnect the instrument from line power. Keep the top cover on while operating the instrument. Do not remove protective covers from PCBs.	**電撃：**この計測器は高電圧を使用し、人体に危害を与える可能性があります。保守・修理は、必ず操業を停止し、電源を切ってから実施して下さい。上部カバーを外したままで 計測器を使用しないで下さい。プリント配線板の保護カバーは外さないで下さい。	電擊：儀器設備使用會造成人身傷害的高伏電壓。在維修之前，必須先關儀器設備並切除電源。務必要在頂蓋蓋上的情況下操作儀器。請勿拆除PCB保護蓋。
	Chemical: This instrument might contain hazardous chemicals. Wear gloves when handling toxic, carcinogenic, mutagenic, or corrosive or irritant chemicals. Use approved containers and proper procedures to dispose waste oil.	**化学物質：**危険な化学物質が計測器中に存在している可能性があります。毒性、発がん性、突然変異性、腐食・刺激性などのある薬品を取り扱う際は、手袋を着用して下さい。廃油の処分には、規定の容器と手順を使用して下さい。	化學品：儀器設備中可能存在有危險性的化學物品。接觸毒性致癌、誘變或腐蝕／刺激性化學品時，請配帶手套。處置廢油時，請使用經過許可的容器和程序。
	Heat: Before servicing the instrument, allow any heated components to cool.	**熱：**熱くなった部品は冷えるのを待ってから保守・修理を行って下さい。	高温：請先等高温零件冷卻之後再進行維修。
	Fire: Use care when operating the system in the presence of flammable gases.	**火災：**可燃性のガスが存在する場所でシステムを操作する場合は、充分な注意を払って下さい。	火災：在有易燃氣體的場地操作該系統時，請務必小心謹慎。
	Eye Hazard: Eye damage could occur from splattered chemicals or flying particles. Wear safety glasses when handling chemicals or servicing the instrument.	**眼に対する危険：**化学物質や微粒子が飛散して眼を傷つける危険性があります。化学物質の取り扱い、あるいは計測器の保守・修理に際しては防護眼鏡を着用して下さい。	眼睛傷害危險：飛濺的化學品或顆粒可能造成眼睛傷害。處理化學品或維修儀器設備時請佩戴安全眼鏡。
	General Hazard: A hazard is present that is not included in the above categories. Also, this symbol appears on the instrument to refer the user to instructions in this manual.	**一般的な危険：**この標識は上記以外のタイプの危険が存在することを示します。また、計測器にこの標識がついている場合は、本マニュアル中の指示を参照して下さい。	一般性危險：說明未包括在上述類別中的其他危險。此外，儀器設備上使用這個標誌，以指示用戶本使用手冊中的說明。
	When the safety of a procedure is questionable, contact your local Technical Support organization for Thermo Fisher Scientific San Jose Products.	**安全を確保する手順がよくわからない時は、作業を一時中止し、お近くのサーモエレクトロンサンローゼプロダクトのテクニカールサポートセンターごご連絡ください。**	如对安全程序有疑问，请在操作之前与当地的菲尼根技术服务中心联系。

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Preface

This guide describes how to connect and use the Thermo Scientific analog-to-digital (A/D) converter.

Contents

- Related Documentation
- Safety and Special Notices
- Contacting Us

Complete a brief survey about this document by clicking the link below. Thank you in advance for your help.

Related Documentation

In addition to this guide, the Thermo Scientific A/D Converter software also provides Help.

Safety and Special Notices

Make sure you follow the precautionary statements presented in this guide. The safety and other special notices appear in boxes.

Safety and special notices include the following:

CAUTION Highlights hazards to humans, property, or the environment. Each CAUTION notice is accompanied by an appropriate CAUTION symbol.

IMPORTANT Highlights information necessary to prevent damage to software, loss of data, or invalid test results; or might contain information that is critical for optimal performance of the system.

Note Highlights information of general interest.

Tip Highlights helpful information that can make a task easier.

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Fax	561-688-8736
E-mail	us.techsupport.analyze@thermofisher.com
Knowledge base	www.thermokb.com

Find software updates and utilities to download at mssupport.thermo.com.

❖ **To contact Customer Service for ordering information**

Phone	800-532-4752
Fax	561-688-8731
E-mail	us.customer-support.analyze@thermofisher.com
Web site	www.thermo.com/ms

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Go to www.thermoscientific.com/wps/portal/ts/contactus.

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- Fill out a reader survey online at www.surveymonkey.com/s/PQM6P62.
- Send an e-mail message to the Technical Publications Editor at techpubs-lcms@thermofisher.com.

Introduction

This introduction provides a basic understanding of the Thermo Scientific A/D converter.

Contents

- Overview
- Capabilities
- System Requirements
- Specifications

Overview

The A/D converter is a compact device for connecting a scientific instrument that outputs an analog signal to a computer, which requires input in digital format. The A/D converter connects to the USB port on the computer, which allows it to draw the power necessary for operation. You use software installed on the computer to configure and control the A/D converter.

Figure 1 shows the front and back views from the top of the A/D converter. The front panel of the device features a 2-line, 16-character alphanumeric instrument display, which you can adjust for maximum visibility. There are two pairs of control buttons, one on each side of the display; their function depends on the software used to control the A/D converter. The front panel has an LED, which lights when the device is processing a signal. The back panel has four different connection ports (see Table 1 for the function of each port). The serial number of the A/D converter is located on the bottom of the unit.

Figure 1. Top front and back views of A/D converter

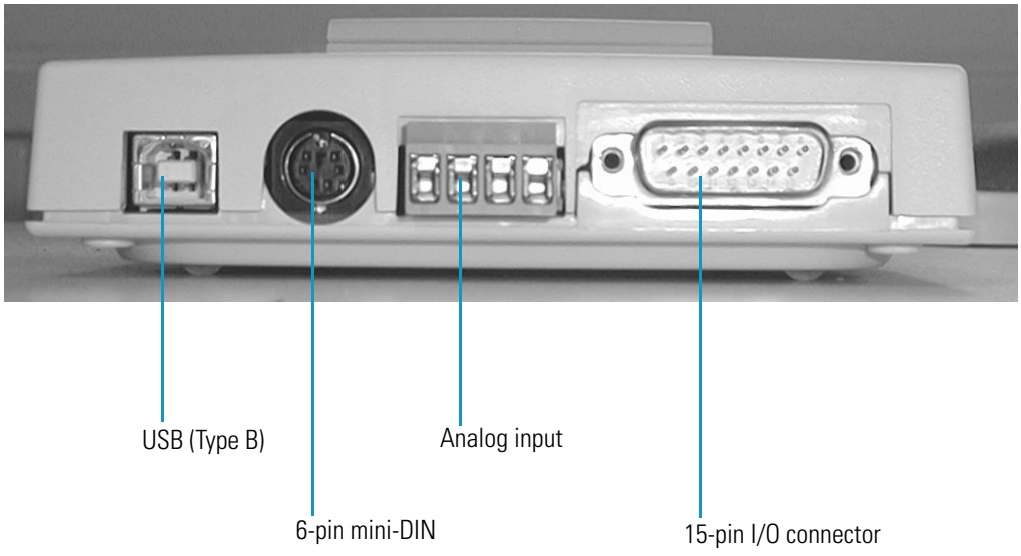


Table 1 lists the types and functions of the A/D converter ports. See Figure 1 for the locations of these ports.

Table 1. Types and functions of the A/D converter ports

Port type	Function
USB (Type B)	Bi-directional data transfer between the computer and A/D converter. Supplies power to the converter.
6-pin mini-DIN	Obtains start and stop signals from the instrument. The start and stop inputs are connected to the start and stop buttons on the top of the converter. You can activate the signals using the buttons or by an external source connected to this port. Provides a small, general purpose signal relay. This is a clean relay contact, isolated from all other electronics. You can use the relay to supply an external data system ready signal.
Analog input	Analog input from instrument.
15-pin I/O connector	Provides three sets of normally open relay contacts. The function of these is determined by the host software. The relays are isolated from all other electronics. There are eight TTL inputs, which you can use for monitoring external events.

Capabilities

The A/D converter connects to an instrument, which outputs an analog signal and converts this input to digital format. The digital signal is then passed to a computer via a USB connection. You set the parameters for the conversion by using software on the computer and downloading them to the device when the operation commences. The computer provides the power for the A/D converter through the USB connection and performs all data storage and configuration functions. You can use a single computer to control multiple A/D converters by employing one or more USB hubs.

Analog Section

The analog section of the A/D converter uses sigma-delta technology to produce a 24-bit digital value. The analog signal applied to the inputs is sampled at a rate of up to 1000 Hz. Sampling ranges are selected through the host computer. The 24-bit number produced by the analog section is buffered as a 3-byte data point in the SRAM. Each data point is stored with a fourth byte, known as the sequence byte. The host computer reads and checks the sequence byte to ensure that all data is received in the correct order.

The analog section can accept inputs in ± 1 V, ± 2 V, ± 5 V, and ± 10 V ranges.

Buttons

The functions of the four user buttons on the top of the A/D converter depend on the software used on the host computer. Pressing a button results in a change being reported to the computer, which then determines a course of action based on the application.

The buttons marked with the start and stop symbols are connected in parallel with the start and stop connections on the 6-pin mini-DIN socket on the back of the A/D converter. You can activate the start and stop signal electrically by an external source, such as the instrument box or a control box. The connections are pulled up to +5 V internally using a 100 kΩ pullup resistor.

Use the buttons marked with left and right arrows to access the previous and next screens on the instrument display.

Instrument Display

The alphanumeric instrument display can display up to two lines of 16 characters each. The hinged panel adjusts to improve the viewing angle.

CAUTION Do not force the panel beyond the vertical position, as this can damage the A/D converter.

The host computer can change the characters displayed on the instrument panel at any time, usually in response to a button press.

Display Screens

You can cycle information on the display panel with the left- and right-side buttons. The descriptions in this section assume that you press the right-side button successively. Using the left-side button reverses the order.

When you plug in the A/D converter and enumerate it on the USB bus, the panel displays the current firmware version and the serial number as shown in the following example.

Format	Example
Thermo V<Firmware>	Thermo V1.8c
Ser No <Serial Number>	Ser No 000832

Once you have cited the A/D converter as an Instrument in the Instrument Manager, the display shown in the next example replaces the first display. The first display then becomes unavailable and the other screens are activated so that you can cycle them using the right- and left-side buttons.

Format	Example
A/D converter <Serial Number> on <Computer Name>	A/D converter 00832 on WILLIAMST

The next screen (example) shows the state of each relay. The relay states are in reverse order —that is, 4, 3, 2, 1.

Format	Example
Relay States: <State> <State> <State> <State>	Relay States: On Off On Off

The next screen (example) shows the FSD value as set in the application.

Format	Example
Voltage Range: ±<Value> Volts	Voltage Range: ±1 Volts

The next screen (example) shows the status of the instrument as indicated in the Instrument Manager window.

Format	Example
Current State: (Status)	Current State: Idle

The next screen (example) shows the current signal output.

Format	Example
Data Monitor: <Value>mv	Data Monitor: 66mv

The final screen (example) shows the firmware version.

Format	Example
Firmware: V<Version Number>	Firmware: V1.8c

Outputs

The A/D converter has four fully independent relay contacts that you can use to switch between external devices. All of the relay contacts are electrically isolated from the internal electronics. The relays are latching, which means they retain their current settings even if you disconnect the device. The relays retain their settings until the host computer changes them. You can switch each relay independently, as instructed by the host computer.

One relay, available at the mini DIN connector on the back panel, is intended as a status output. It has both normally open and normally closed contacts.

The remaining three relays are normally open and are available on the 15-pin D-type connector on the back panel.

Inputs

The A/D converter has eight independent inputs that you can use to monitor external events. Each is a TTL input that is pulled up internally to +5 V using a 100 kΩ resistor. The host computer reads the status of the inputs at any time.

Table 2. A/D converter input parameters

Analog input voltage ranges	• ±1 V • ±2 V • ±5 V • ±10 V
Data sampling rates	• 250 Hz • 500 Hz • 1000 Hz
Data transfer rate	12 MB

System Requirements

This section provides system requirements to operate the A/D converter.

System Computer

Connect the A/D converter to a DataServer or 247 Instrument Controller. Or, use a computer running a supported operating system with DataServer or 247 Instrument Controller software installed. The computer must have an available USB port. Use DataServer or 247 Instrument Controller software to configure and control the A/D converter. Refer to the appropriate software documentation for the hardware requirements of the software. You must install the software before you connect the A/D converter.

Cables and Connectors

Table 3 lists the cables and connectors for the A/D converter.

Table 3. A/D converter cables and connectors

Cable	Connector
USB cable (supplied)	USB Type A to USB Type B connectors
6-pin mini-DIN Cable 1.5 m (supplied)	6-pin mini-DIN connector to bare wire
Analog cable 1.5 m (supplied)	Belden™ part number 9501

Operating Conditions

Table 4 lists the A/D converter operating conditions.

Table 4. A/D converter operating conditions

Operating condition	Temperature and humidity
Operating temperature	10–40 °C
Storage temperature	0–60 °C
Humidity	10–90%

Location

Place the A/D converter on a secure, flat surface. The maximum length of cable between the A/D converter and either a computer or a USB hub is 5 m. You can connect hubs to allow a single computer to operate multiple A/D converters. Refer to the USB specification for further details.

CAUTION If the computer fails, you lose all unsaved data. To prevent data loss, save your data transferred through a cable before disconnecting that cable.

Specifications

This section provides the specifications for the A/D converter.

- Physical Specifications
- Major Components
- Electrical Specifications
- Data Processing Parameters
- Electronics

Physical Specifications

Table 5 lists the physical specifications of the A/D converter

Table 5. Physical specifications of the A/D converter

Dimensions and weight	
Width	13.5 cm
Length	19.5 cm
Height	3.3 cm
Weight	33.5 g
Materials	
Exterior casing: Recyclable, fire-retardant acrylonitrile butadiene styrene (ABS)	
Operating environment	
Operating temperature	10–40 °C
Storage temperature	0–60 °C
Humidity	10–90%

Major Components

Table 6 lists the major components of the A/D converter.

Table 6. Major components of the A/D converter (Sheet 1 of 2)

Component	Characteristics
Display screen	2-line, 16-character, alphanumeric
A/D converter relays	• Single channel, 24-bit • 3 normally open relays • 1 changeover relay

Table 6. Major components of the A/D converter (Sheet 2 of 2)

Component	Characteristics
Inputs	• Start and stop inputs • 8 transistor-transistor logic (TTL) inputs
Control buttons	• Four (4) • Function defined by application
LED	• One (1) • Indicates processing in progress

Electrical Specifications

Table 7 lists the electrical specifications of the A/D converter.

Table 7. Electrical specifications of the A/D converter

Item	Specification
Electrical supply from the computer	• 120 mA (maximum) • 5 V
Instrument input voltage	4 ranges: • ±1 V • ±2 V • ±5 V • ± 10 V

Data Processing Parameters

Table 8 lists the data processing parameters of the A/D converter.

Table 8. Data processing parameters of the A/D converter

Parameter	Specification
Data transfer speed	12 MB
Sampling rate	3 rates: • 250 Hz • 500 Hz • 1000 Hz • 24 bits bipolar

Electronics

This section lists the electronics parameters for the A/D converter with accompanying illustrations.

Analog Input

Figure 2 and Table 9 show the analog input that the A/D converter uses.

Figure 2. Analog input socket numbers

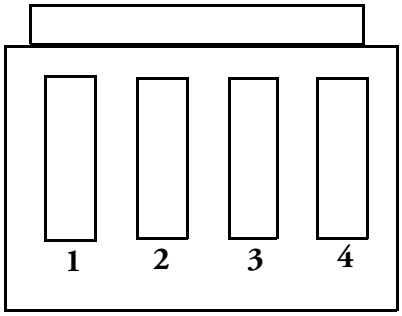


Table 9. Analog input parameters

Socket	Function
1	Analog positive
2	Analog negative
3	Analog ground
4	Digital ground

6-Pin Mini-DIN

Figure 3 and Table 10 show the 6-pin mini-DIN input that the A/D converter uses.

Figure 3. 6-pin mini-DIN socket numbers

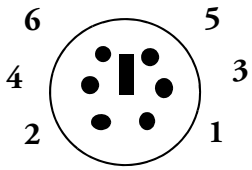


Table 10. 6-pin mini-DIN input parameters

Socket	Function	Wire color
1	Digital ground	Black
2	Start input	Red
3	Stop input	Blue
4	Relay 1 changeover relay (normally open)	White
5	Relay 1 changeover relay (common)	Green
6	Relay 1 changeover relay (normally closed)	Yellow

15-Pin I/O Connector

Figure 4 and Table 11 show the 15-pin I/O connector input that the A/D converter uses.

Figure 4. 15-pin I/O connector pin numbers

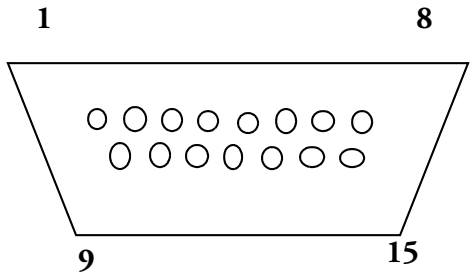


Table 11. 15-pin I/O connector parameters (Sheet 1 of 2)

Pin	Function
1	Input 7
2	Input 6
3	Input 5
4	Input 4
5	Input 3
6	Input 2
7	Input 1

Table 11. 15-pin I/O connector parameters (Sheet 2 of 2)

Pin	Function
8	Input 0
9	Relay 4 (normally open)
10	Relay 4 (normally open)
11	Relay 3 (normally open)
12	Relay 3 (normally open)
13	Relay 2 (normally open)
14	Relay 2 (normally open)
15	Digital ground

Setting Up the A/D Converter

This chapter provides instructions on setting up the Thermo Scientific A/D converter.

Contents

- Installing the A/D Device on a Host Computer
- Installing the A/D Device on a Host Computer with Microsoft Windows 7 Operating System
- Making Hardware Connections
- Adding the A/D converter to Xcalibur Instrument Configuration
- Setting Up an Instrument Method for the A/D Converter

Installing the A/D Device on a Host Computer

Note You must install the Thermo Scientific A/D device driver on the software CD before connecting the A/D converter with the host computer.

Connecting the A/D converter with the host computer involves the installation of the A/D loader and A/D driver.

❖ To install the A/D loader and driver on a host computer

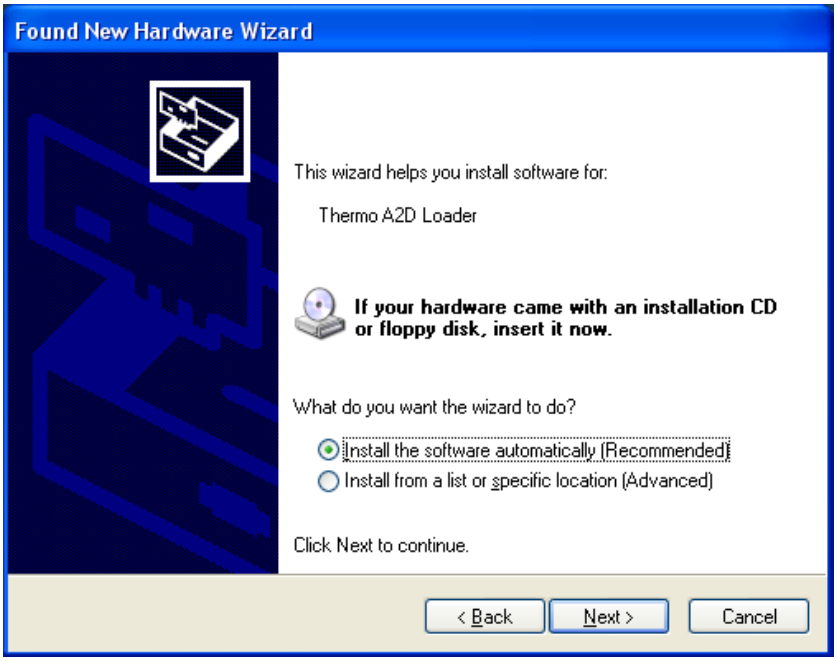
1. Connect the USB port on the A/D converter to a USB port on the host computer using the USB cable. The Found New Hardware Wizard (for the A/D loader) appears (see Figure 5).

Figure 5. Found New Hardware Wizard (for the A/D loader)

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

2. Select the **No, Not This Time** option, and click **Next**. The next page of the wizard appears (see Figure 6).

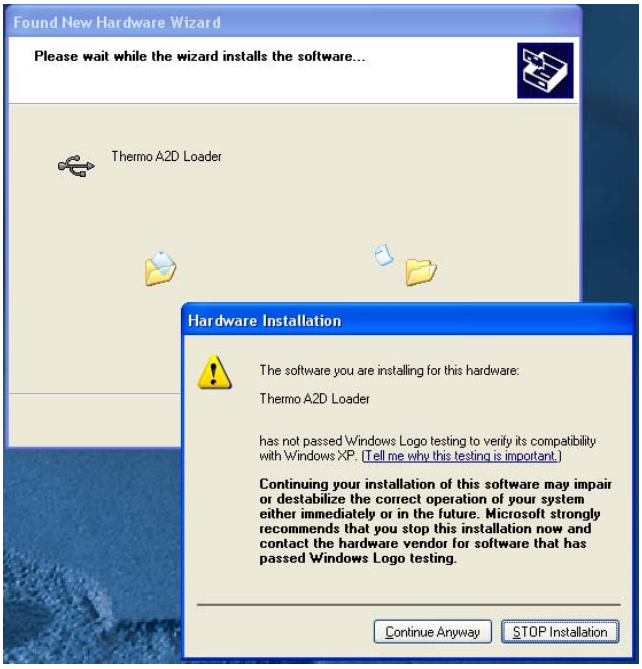
Figure 6. Found New Hardware Wizard (for the A/D loader) – installation options


Found New Hardware Wizard
This wizard helps you install software for:
Thermo A2D Loader
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

3. Select the **Install the Software Automatically (Recommended)** option, and click **Next**.

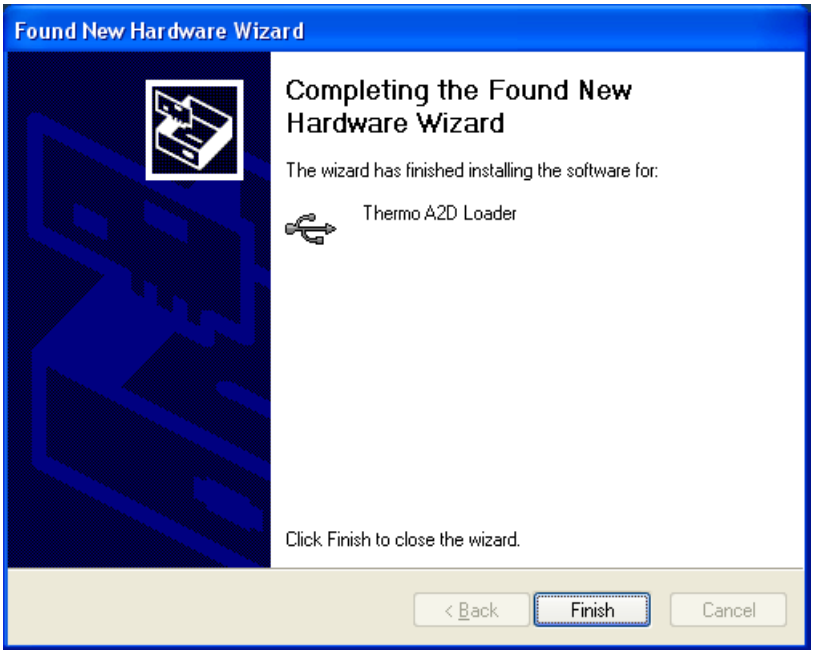
   The Thermo A/D loader installation starts and the Hardware Installation dialog box appears (see Figure 7).

Figure 7. Found New Hardware Wizard (for the A/D loader) and Hardware Installation dialog box


Found New Hardware Wizard
Please wait while the wizard installs the software...
Thermo A2D Loader
Hardware Installation
The software you are installing for this hardware:
Thermo A2D Loader
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

4. In the Hardware Installation dialog box, click **Continue Anyway**. The final page of the Found New Hardware Wizard appears (see Figure 8).

Figure 8. Final page of the Found New Hardware Wizard (for the A/D loader)



5. Click **Finish**.

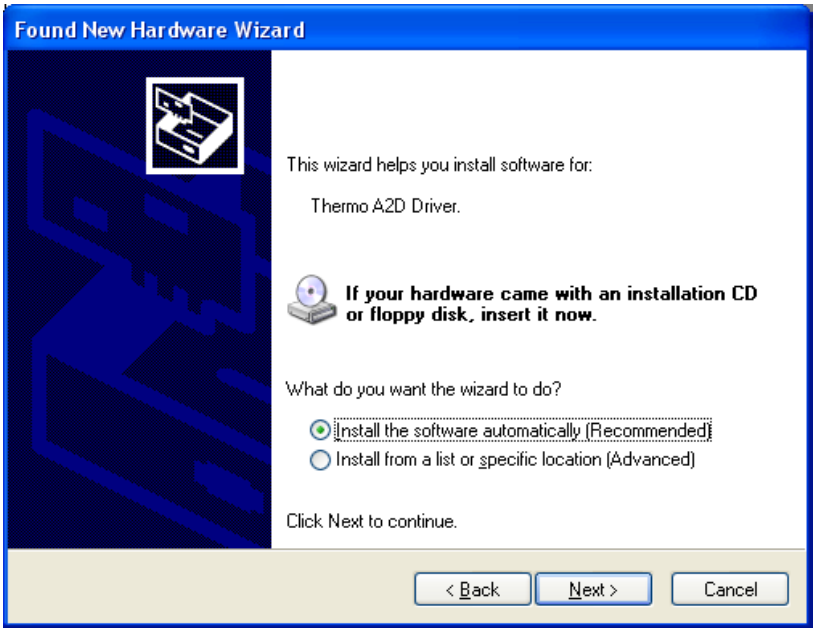
6. Look for the message, "Found USB A/D Driver," to appear in the lower right corner of the computer screen. The Found New Hardware Wizard (for the A/D driver) appears (see Figure 9).

Figure 9. Found New Hardware Wizard (for the A/D driver)

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

7. Select the **No, Not This Time** option, and click **Next**. The next page of the wizard appears (see Figure 10).

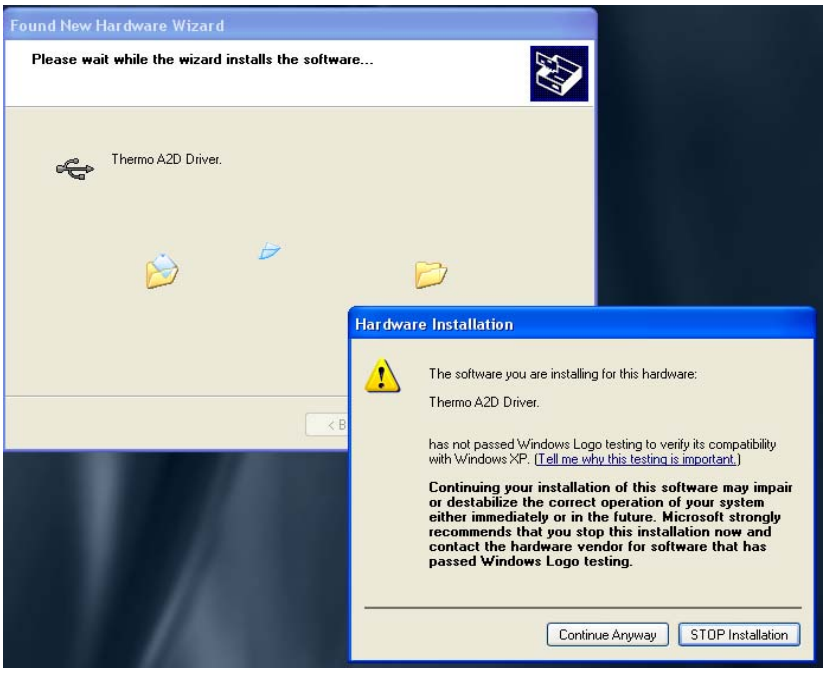
Figure 10. Found New Hardware Wizard (for the A/D driver) – installation options


Found New Hardware Wizard
This wizard helps you install software for:
Thermo A2D Driver.
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

8. Select the **Install the Software Automatically (Recommended)** option, and click **Next**.

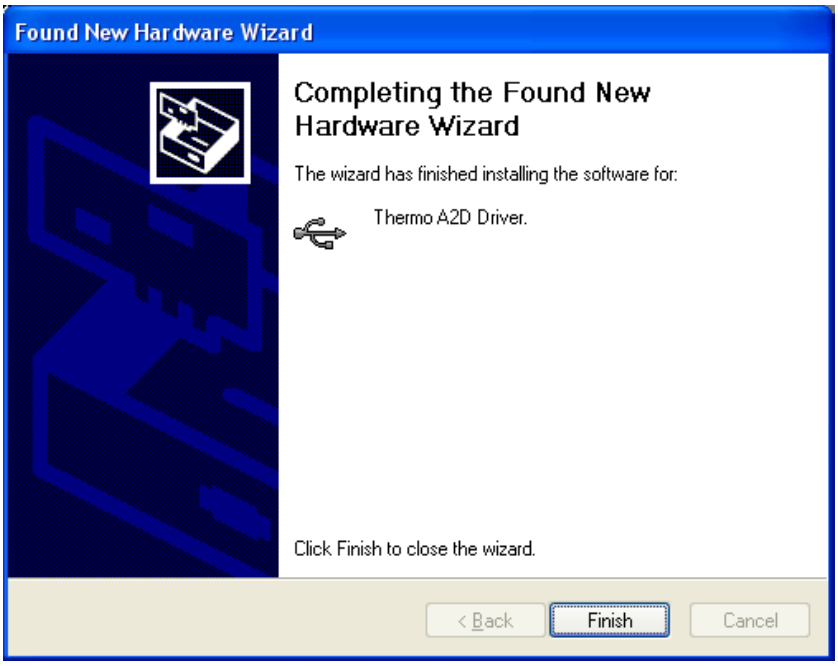
The Thermo A/D driver installation starts and the Hardware Installation dialog box appears (see Figure 11).

Figure 11. Found New Hadware Wizard (for the A/D driver) and Hardware Installation dialog box


Found New Hardware Wizard
Please wait while the wizard installs the software...
Thermo A2D Driver.
Hardware Installation
The software you are installing for this hardware:
Thermo A2D Driver.
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

9. In the Hardware Installation dialog box, click **Continue Anyway**. The final page of the Found New Hardware Wizard appears (see Figure 12).

Figure 12. Final page of the Found New Hardware Wizard (for the A/D driver)



10. Click **Finish**.

The A/D loader and driver installation is complete.

Installing the A/D Device on a Host Computer with Microsoft Windows 7 Operating System

❖ **To install the A/D device driver on a host computer with Windows 7**

1. Install both the LC Devices 2.5 and the Thermo Scientific A/D converter software.
2. Connect the USB port on the A/D converter to a USB port on the host computer using the USB cable.

Windows 7 displays the message "New Device Found," and then starts installing the A/D device driver automatically. When the installation is complete, the message, "Device driver software installed successfully. Your device is ready to use," displays in the lower right corner of the computer screen.

Making Hardware Connections

This section provides instructions on making hardware connections between the A/D converter, the data system computer, and the instrument for data acquisition.

- Connecting the A/D converter to the data system computer
- Connecting the Trigger and Signal Cables

Connecting the A/D converter to the data system computer

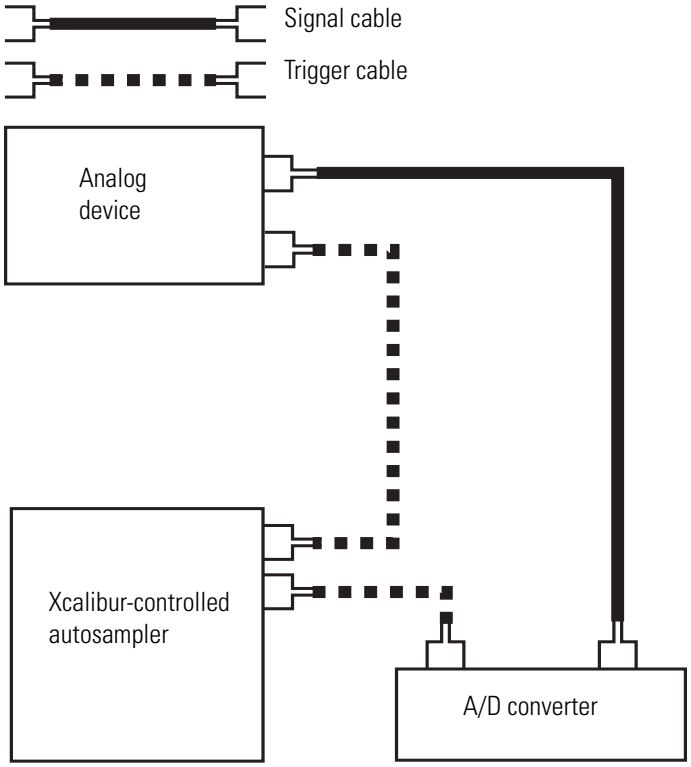
❖ **To connect the A/D converter to the data system computer**

1. Turn off the data system computer.
2. Connect one end of the USB cable (included with the Thermo Scientific A/D converter kit) to the USB inlet on the back panel of the A/D converter.
3. Connect the other end of the USB cable to the USB port on the data system computer.
4. Restart the data system computer.

Connecting the Trigger and Signal Cables

Figure 13 shows the wiring diagram for triggering data acquisition and data collection through the A/D converter from an analog device.

Figure 13. Wiring diagram triggering data acquisition and data collection from an analog device



❖ To connect the trigger and signal cables

1. Connect the 2-wire signal cable (the 1.5 m analog cable) from the A/D converter to the analog device (see Table 12).

   Table 12. Connection between an analog device and the A/D converter for data acquisition

A/D analog input	Analog device (0 to 1 V, 2 V, 5 V, or 10 V)
Socket 1 analog positive	Signal output pin
Socket 3 analog ground	Ground pin

2. Connect a trigger cable from the analog device to the instrument (autosampler) (see Table 13).

   Table 13. Connection between the analog device and the autosampler

Analog device	Autosampler
Start in pin	Inject out pin
Ground pin	Ground pin

3. Connect the 6-pin mini-DIN cable from the A/D converter to the autosampler (see Table 14).

Table 14. Connection between the A/D converter and the autosampler

A/D converter	Autosampler
Red wire (6-pin mini-DIN)	Inject out pin
Black wire (6-pin mini-DIN)	Ground pin

Adding the A/D converter to Xcalibur Instrument Configuration

This section provides instructions on adding the Thermo A/D converter to the Xcalibur Instrument Configuration window.

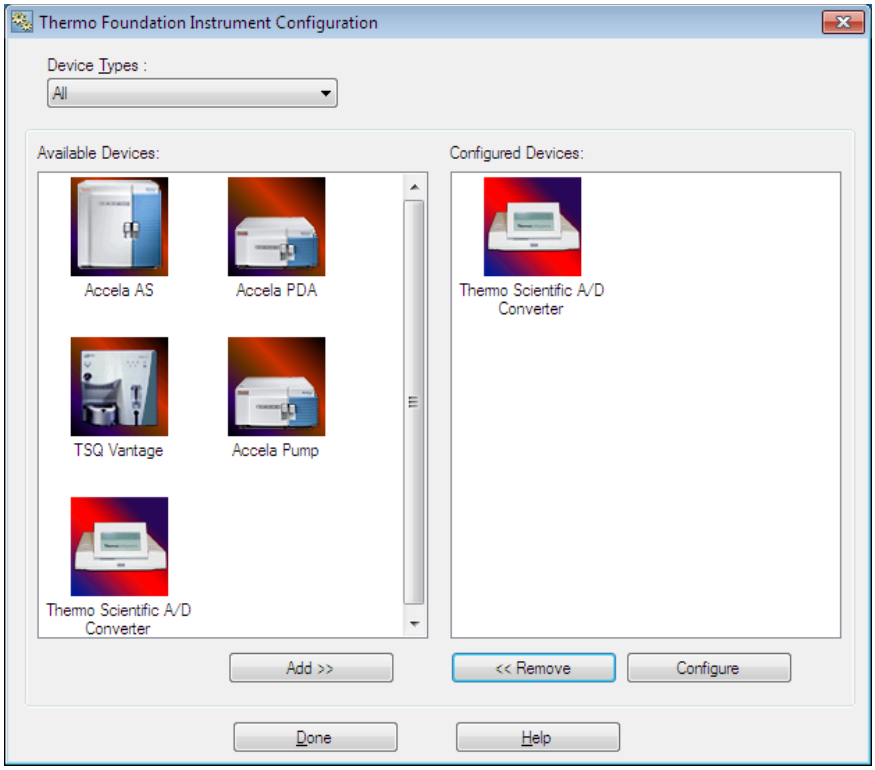
Note Before adding the A/D converter to Xcalibur Instrument Configuration, ensure the A/D device has been installed on the host computer and all the hardware connections have been completed successfully.

❖ To add the A/D converter to the instrument configuration

1. From the computer desktop, choose **Start > All Programs >Thermo Foundation 1.0 > Instrument Configuration**.
2. In the Thermo Foundation Instrument Configuration window, double-click the **Thermo Scientific A/D Converter** icon in the Available Devices pane.

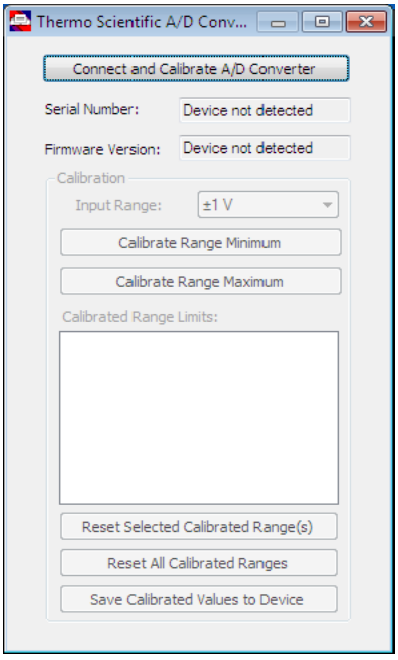
   A copy of the A/D Converter icon appears in the Configured Devices pane (see Figure 14).

Figure 14. Thermo Foundation Instrument Configuration window



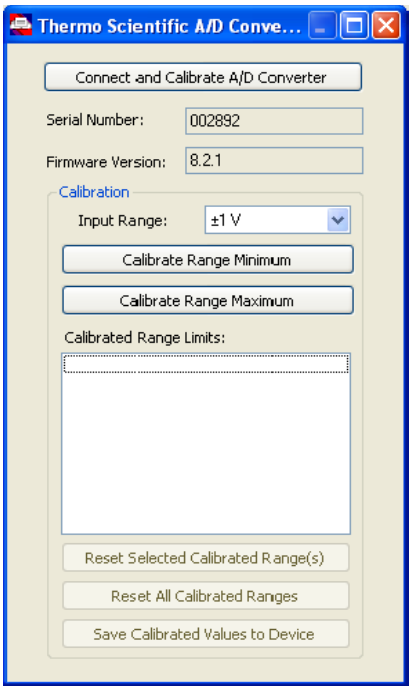
3. In the Configured Devices pane, double-click the **Thermo Scientific A/D Converter** icon. The Thermo Scientific A/D Converter dialog box appears (see Figure 15).

Figure 15. Thermo Scientific A/D Converter dialog box



4. Click **Connect and Calibrate A/D Converter**. The serial number and firmware version appear (see Figure 16).

Figure 16. A/D Converter dialog box showing serial number and firware version



Note You do not need to perform a calibration because the unit is already factory-calibrated. If a calibration is warranted, however, contact a Thermo Scientific field service engineer.

Setting Up an Instrument Method for the A/D Converter

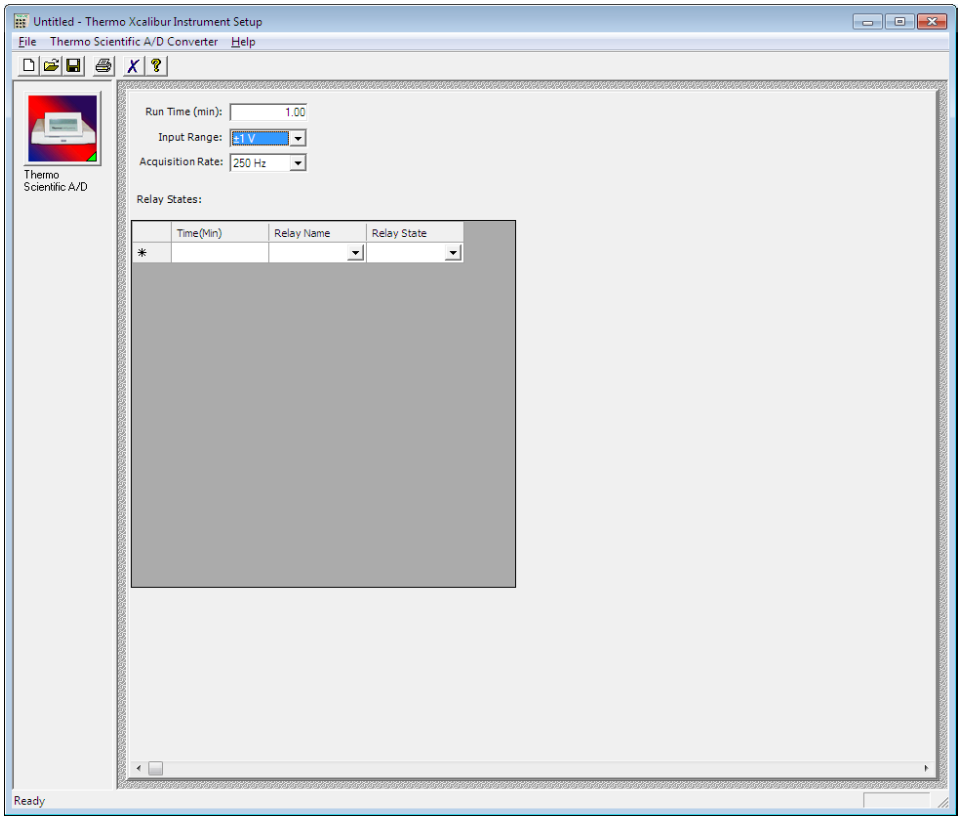
This section provides instructions on setting up an instrument method for the Thermo Scientific A/D converter.

❖ To set up an instrument method for the A/D converter

1. From the Xcalibur Home Page, click (Instrument Setup). The Thermo Xcalibur Instrument Setup window opens.

2. Click the **Thermo Scientific A/D converter** icon in the viewbar. The Thermo Scientific A/D Converter instrument setup window appears (see Figure 17).

Figure 17. Thermo Scientific A/D Converter window



3. Enter the necessary parameters to create a method.
4. Save the method.

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